

REMARKS

Claims 11-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bialko et al U.S. Patent No. 4,131,533 in view of Provence et al U.S. Patent No. 4,695,700.

Claims 1-4 and 6 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Robertson et al. in view of E. van de Van et al, and Patrick et al. (U.S. Patent No. 5,474,648).

Claim 5 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Robertson et al. and further in view of Boys et al.

Reasons This Amendment After Final Should Be Entered

Applicant recognizes that the Examiner has discretion in entering an amendment after final rejection, and believes that the present amendment is sufficiently focused to be appropriate for entry. Claims 1-2 and 15 have been canceled. This amendment directs the claims to a substrate processing system having an impedance probe coupled between a substrate holder and a gas inlet. By doing so, this significantly narrows the issues in the present case. Furthermore, the amendment directly also addresses the Examiner's concerns regarding the possible breadth of the claim language prior to this amendment. Claims 11-21 more fully recite the structural and functional characteristics of the claim elements in order to underscore the distinctions over the prior art. Dependent claims 13 and 14 have been amended to recite an impedance tuner. Support for this limitation can be found in the specification at page 28, lines 5-15. No new matter has been added with these amendments. With respect to new claims 19, 20 and 21 applicant submits that these claims incorporate material formerly in claims 13, 14 and 15. Applicants submit that no new matter has been entered with these amendments. Furthermore, Applicants submit that these amendments would present the rejected claims in a better form for consideration in the event of an appeal.

The Rejection Under 35 U.S.C. 103(a)

Claims 1-6

Claims 1-2 have been canceled therefore the rejection is moot with respect to these claims. Claim 3 has been amended to depend from claim 11 and recites additional features therefore. Claims 4-6 depend from claim 3 and recite additional features therefor. Applicants believe that claims 3-6 are allowable for the reasons set forth below with respect to claim 11.

Claims 11-18

Applicants respectfully traverse the rejection of claims 11-18. In rejecting the claims, the Examiner states that Bialko describes RF driven sputter deposition apparatus. Furthermore, the Examiner states that Bialko's apparatus includes matching networks that measure the impedance and provide a response to the power sources delivering power to the reactor. The rejection is respectfully traversed.

Claim 11 recites an impedance monitor coupled between a substrate holder and a gas inlet to measure the reactor impedance. Monitoring the impedance in this fashion is particularly useful because, in some processes, the reactor impedance has a definite effect on film properties. Nowhere does Bialko describe measuring the impedance with matching network 30. Furthermore, Bialko does not describe an impedance monitor coupled to low and high frequency electrodes as recited in claim 11. Instead, matching network 30 of Bialko, coupled only to target electrode 7, provides means for reducing reflected power to generator 26 during sputtering operations (see col. 4, lines 54-56). In addition, none of the other prior art of record teaches or suggests measuring the reactor impedance this way. Patrick teaches a power sensor 206 connected only to the top electrode. Boys teaches a power source 37 connected between chamber housing 16 and a pole piece 24 (see Fig. 1). Boys describes the power source as including voltage measurement circuitry for providing a signal indicative of the voltage between pole piece 16 target cathode 15. Note that substrate 14 is not connected to any power source, power meter, voltage meter, or current meter. At best, Provence teaches a matching circuit coupled to an upper electrode 30 (see Fig. 4) None of these arrangements is configured to measure the impedance between upper and a substrate holder and a gas inlet as

last sentence
of example 1
↓
Patrick
et al
"Character"

presently recited in claim 11. As such a prima facie case of obviousness is not present since no combination of the references teaches all the limitations of claim 11. Therefore applicants submit that claim 11 is not obvious over the prior art of record and defines an invention suitable for patent protection.

Furthermore, claims 12-16 and 19-21 depend either directly or indirectly from claim 11 and recite additional features therefor. As such, and for the reasons set forth above with respect to claim 11, Applicants submit that these dependent claims are not obvious over the prior art of record and define an invention suitable for patent protection.

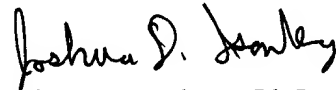
Claim 17 recites a substrate processing system having means for maintaining deposition conditions suitable to deposit a layer from one or more process gases. Furthermore claim 17 recites means for adjusting deposition conditions in the reaction zone in response to an impedance level. Bialko, by contrast, teaches a sputtering apparatus. Such an apparatus deposits material sputtered from a target. The system of claim 17, by contrast, deposits a layer from one or more process gases. Furthermore, Provence teaches an etching apparatus. Such an apparatus removes material from a substrate. The system of claim 17, by contrast, deposits material. Thus neither Bialko, Provence nor any combination thereof teaches or suggests a system that deposits a layer of material from one or more process gases while monitoring an impedance level and adjusts deposition conditions in response to the monitored impedance level. As such a prima facie case of obviousness is not present since no combination of the references teaches all the limitations of claim 17.

Therefore applicants submit that claim 17 is not obvious over the prior art of record and defines an invention suitable for patent protection. In addition, claim 18 depends from claim 17 and recites additional features therefore, as such and for the reasons stated with respect to claim 17, applicants submit that claim 18 defines an invention suitable for patent protection.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance and an action to that end is urged. If the Examiner believes a telephone conference would aid in the prosecution of this case in any way, please call the undersigned at 650-326-2400.

Respectfully submitted,



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